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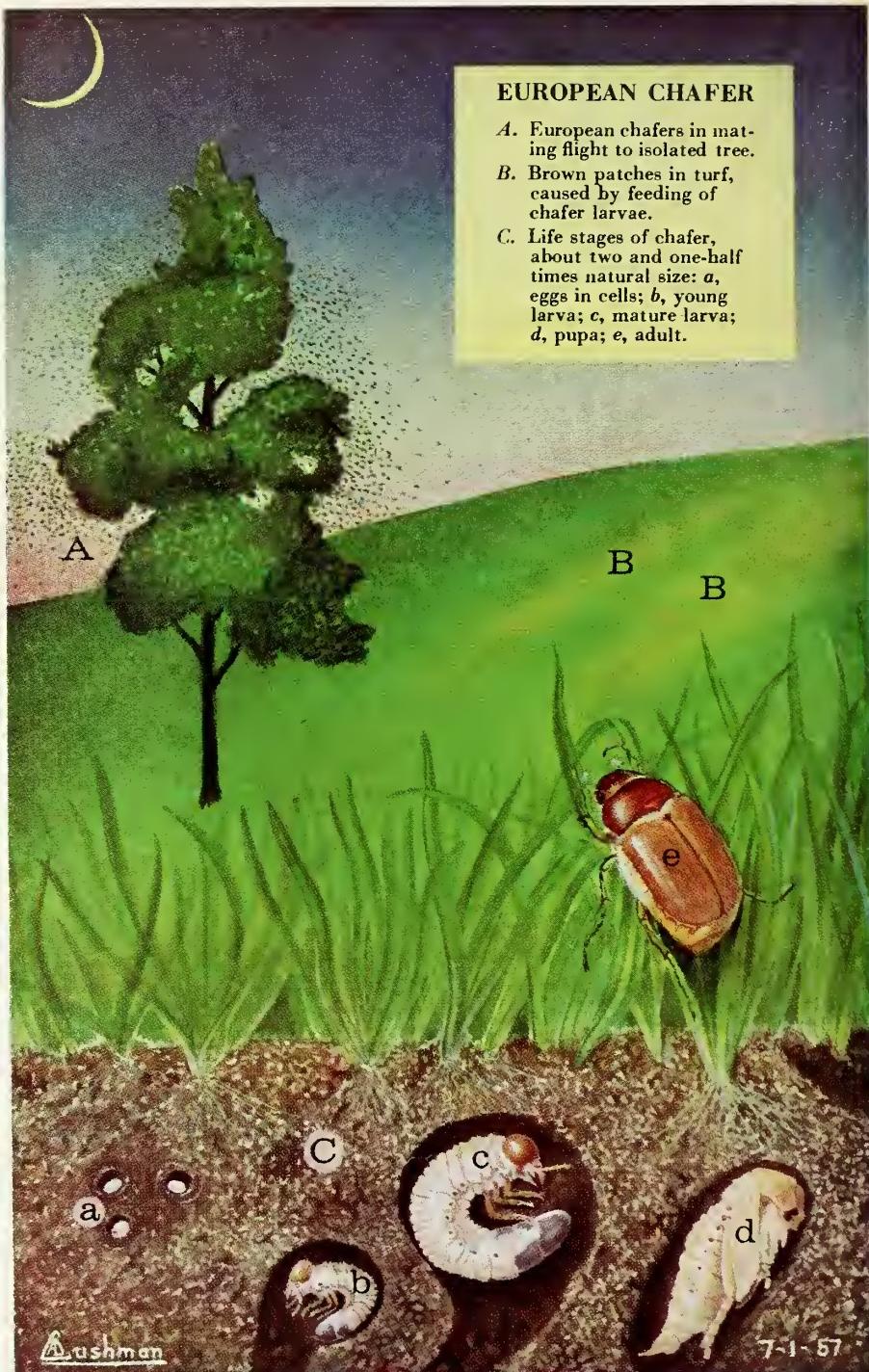
European **CHAFER**

... how we fight it



PA-455 (R)

U.S. DEPARTMENT OF AGRICULTURE



EUROPEAN CHAFER

- A. European chafers in mating flight to isolated tree.
- B. Brown patches in turf, caused by feeding of chafer larvae.
- C. Life stages of chafer, about two and one-half times natural size: a, eggs in cells; b, young larva; c, mature larva; d, pupa; e, adult.



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**European
CHAFER**
... how we fight it

The larvae, or grubs, of the European chafer¹ damage and often destroy lawns, turf, pastures, legumes, and winter grains. They feed on the roots of plants, and create unsightly, barren spots that make the soil subject to rapid erosion. The adults (beetles) of this insect do little feeding, and cause little damage.

OCCURRENCE

The European chafer was first found in the United States in 1940 in Wayne County, N.Y. It is believed to have entered this country from Europe in the late 1920's or early 1930's. In 1951 an infestation of the pest was found in Meriden, New Haven County, Conn. In 1954 another infestation, now eradicated, appeared in Capon Bridge, W. Va. In 1960 the first New Jersey in-

festation was found in the Jersey City-Bayonne area of Hudson County, and in 1963 the first Pennsylvania infestation was found in Erie County. In 1965 the pest was discovered in Ohio. In 1966, chafers were found in Massachusetts. New York State is the only area in this country where the European chafer occurs extensively. In Canada it is established in the vicinity of Niagara Falls, Ontario.

DEVELOPMENT AND HABITS

In its development, the European chafer has four stages—egg, larva (or grub), pupa, and adult (or beetle). The insect is destructive only in the larval stage.

The life cycle usually is completed in 1 year, but occasionally requires 2 years.

In June or July each female beetle lays 20 to 40 milk-white eggs, 2 to 6

¹ *Amphimallon majalis*.

inches deep in the soil. Soon afterward the female dies.

Larvae hatch from the eggs in 2 to 3 weeks; they start immediately to feed on roots of grasses and other plants. When fully grown, in about $3\frac{1}{2}$ months, they are C-shaped, about $\frac{3}{4}$ inch long, and white; they have brown heads.

Larvae feed throughout summer, and burrow below the frost line in fall. The following spring they come nearer to the surface and resume feeding.

After feeding during spring, most larvae change to pupae. Some spend a second summer in the soil and change to pupae the second spring.

Newly formed pupae are soft bodied and creamy white. They turn reddish brown just before they change to beetles.

The beetles resemble May beetles (also called June beetles). They are oval, about $\frac{1}{2}$ inch long, and light brown or tan. Shallow grooves occur lengthwise on their horny forewings.

In a normal season, beetles emerge from the soil about the middle of June; they appear only for brief mating flights. About sunset on warm days, thousands of these insects swarm like bees around trees, tall shrubs, light poles, or similar objects. They fly for about half an hour, then settle on the objects to mate. At dawn they burrow into the soil, and the females lay their eggs. Mating flights may be repeated several times in a season. The beetles are most abundant from mid-June to July 10.

HOW INFESTATIONS SPREAD

European chafers may fly as far as 2 miles during a mating flight, spreading their infestation over an area

of that radius. The beetles may be carried long distances in automobiles, railway cars, or aircraft. All forms of the insect may be transported from place to place in gravel, soil, and sod, and among roots of plants to which soil is attached.

QUARANTINES

Areas infested with the European chafer are under a Federal quarantine designed to prevent interstate spread of the insect. Similar State quarantines are in force to prevent spread within State borders.

Where quarantines are in force, a certificate is required for the shipment of articles that might harbor the eggs, larvae, pupae, or beetles of the chafer. Such articles include sod, topsoil, gravel, sand, and plants with soil on the roots. Certificates are required to ship previously infested articles after they have been made free of infestation by the use of insecticides or by other approved means.

Information about State and Federal quarantine regulations may be obtained from State departments of agriculture, county agricultural agents, or plant pest control offices of the U.S. Department of Agriculture.

DETECTING INFESTATIONS

The best way to detect infestations is to watch for larvae in sod, and for mating flights of the beetles during June and July.

Signs that the European chafer may be present include—

- Large numbers of beetles “swarming” about trees, shrubs, or light poles during evening hours in June or early July.
- Dead or dying spots in lawns, in turf of golf courses, cemeteries, pastures, or in fields of winter grains.

- White larvae feeding on the roots of plants around the edges of bare spots in sod or fields of grain.
- Loosened soil in bare spots of sod, indicating that birds, moles, skunks, or other animals have been digging for larvae.

These signs may indicate only the *possibility* of European chafer infestation. They could also indicate presence of the Japanese beetle or the May beetle. All three insects are destructive.

HOW YOU CAN HELP

State and Federal agricultural agencies use measures to control the European chafer wherever its presence is detected. Entomologists of these agencies make annual surveys to locate infestations and determine the extent of the chafer's spread. You can help to detect and control the insect if you—

- Watch for signs of this pest in your area. Collect specimens of larvae or beetles in rubbing alcohol and give or mail them promptly to your county agent, to your State entomologist, to a local plant pest control representative, or to the Plant Pest Control Division, U.S. Department of Agriculture, Washington, D.C., 20250. Include your name and address, the date you collected the specimens, and a note stating that they may be the European chafer. *Do not send live specimens through the mail.*

- Apply insecticide if you discover an infestation on your property.
- Comply with State and Federal regulations governing the movement of articles from infested areas.
- Cooperate with local plant pest control officials in controlling infestations.
- Persuade your neighbors to co-

operate in detecting evidence of the pest and reporting suspected infestations.

CONTROL WITH INSECTICIDE

The only practical way to control the European chafer is to kill the larvae by applying insecticide to the soil. Wettable powders, dusts, or granules may be used. A single application will give satisfactory control for at least 3 years.

Caution: Pasture, grain, or hay land requires special treatment to prevent leaving dangerous insecticide residues. Before applying insecticide to such areas, get the recommendations of your State or Federal plant pest control inspector or State experiment station. Follow instructions on insecticide container labels.

Treating Large Areas

To treat large areas of nonagricultural land, apply dieldrin, aldrin, or heptachlor at the rate of 3 pounds of actual insecticide per acre; or, apply chlordane at the rate of 10 pounds per acre.

Purchased products may contain 5 to 50 percent of actual insecticide. Refer to container labels to learn the strength of the products you buy.

Treating Small Areas

Recommendations by various States may differ slightly with respect to materials and dosages. However, insecticides listed in the accompanying guide² will give satisfactory control if applied as indicated. The areas should be watered but not flooded after insecticide has been applied.

² Partially based on research by Cornell University, Geneva and Ithaca, N.Y.

Guide for applying insecticide to control the European chafer in lawns, turf, and other nonagricultural land

Insecticide	Amount to apply to 1,000 square feet			
	Wettable powder		Dust or granules	
	25 percent	50 percent	5 percent	10 percent
Dieleldrin	5 ounces . . .	2½ ounces . .	1½	¾
Aldrin	5 ounces . . .	2½ ounces . .	1½	¾
Heptachlor	5 ounces . . .	2½ ounces . .	1½	¾
Chlordane	1 pound	½ pound . . .	5	2½

PRECAUTIONS

Pesticides used improperly can be injurious to man and animals. Use them only when needed and handle them with care. Follow the directions and heed all precautions on the labels.

Some States have special restrictions on the use of certain pesticides. Before applying pesticides, check State and local regulations.

Keep pesticides in closed, well-labeled containers in a dry place. Store them where they will not contaminate food or feed, and where children and animals cannot reach them. Promptly dispose of empty pesticide containers; do not use for any other purpose.

When handling a pesticide, wear clean, dry clothing.

Avoid repeated or prolonged contact of pesticide with your skin.

Wear protective clothing and equipment if specified on the container label. Avoid prolonged inhalation of pesticide dusts or mists.

Avoid spilling a pesticide concentrate on your skin, and keep it out of your eyes, nose, and mouth. If you spill any on your skin or clothing, remove contaminated clothing immediately and wash the skin thoroughly with soap and water. Launder the clothing before wearing it again.

After handling a pesticide, do not eat, drink, or smoke until you have washed your hands and face. Wash any exposed skin immediately after applying a pesticide.

Avoid drift of pesticide to nearby wildlife habitats, bee yards, crops, or livestock. Do not apply pesticides under conditions favoring drift from the area to be treated.

Many pesticides are highly toxic to fish and aquatic animals. Keep pesticides out of all water sources such as ponds, streams, and wells. Do not clean spraying equipment or dump excess spray material near such water.

Do not apply pesticides to plants during hours when honey bees and other pollinating insects are visiting them.

Have empty pesticide containers buried at a sanitary land-fill dump, or crush and bury them at least 18 inches deep in a level, isolated place where they will not contaminate water supplies. If you have trash-collection service, thoroughly wrap small containers in several layers of newspaper and place them in the trash can.

It is difficult to remove all traces of herbicides from equipment. For this reason, do not use the same equipment for applying herbicides that you use for insecticides and fungicides.



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U.S. DEPARTMENT OF AGRICULTURE

